Towards a canonical elastoplastic damage model

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Engineering Fracture Mechanics
Vol. 48, Issue.2, 1994

Abstract: Fundamental aspects of elastoplastic damage are outlined. Time-independent isotropic damage is considered in order to study material degradation. By splitting the total strain tensor into its components of elastic damage and plastic damage and using recoverable energy equivalence, three distinct modes of behavior are particularized. For each mode of behavior, a suitable damage variable is culled. An in-depth analysis of this formulation reveals a certain incongruity in the assumptions postulated in some of the previously proposed models. The suggested generalized concepts are supported by experimental evidence.